What is claimed is:

1. A method for compensating for motion prediction on each of a plurality of motion compensating blocks formed by dividing an objective frame image of successive frame images by using a plurality of reference frame images while sequentially changing pixel-based sizes of the plurality of motion compensating blocks, the method comprising steps of:

a hierarchizing step of thinning out pixels of a motion compensating block having a greatest pixel-based size to be taken as an uppermost layer of among blocks with smaller pixel-based sizes, to generate a size-reduced block in a lower layer having a predetermined size-reduction ratio;

a search range determining step of determining motion vector search ranges respectively within the plurality of reference frame images, on the basis of the size-reduced block and other size-reduced blocks, and a plurality of size-reduced reference images reduced in size corresponding to the size-reduction ratios of the sized-reduced block and other size-reduced blocks respectively; and

a detecting step of detecting an optimal motion vector while sequentially changing the pixel-based sizes of the plurality of motion compensating blocks by using each of the motion vector search ranges determined in the search range determining step.

2. A method for compensating for motion prediction

according to claim 1, wherein the search range determining step determines the motion vector search ranges depending upon respective differences in pixel-based values from respective of the size-reduced reference images.

3. A method for compensating for motion prediction according to claim 2, wherein the search range determining step carries out block matching sequentially on the size-reduced reference images with the size-reduced block, so as to determine the search ranges on the basis of an absolute-value sum of a difference between a pixel-based value within the size-reduced block and a pixel-based value within a block corresponding to the size-reduced block within a predetermined size-reduced reference image.

4. A method for compensating for motion prediction according to claim 3, wherein the search range determining step determines the search ranges depending upon an absolute-value sum of differences between a pixel value of every other pixel with respect to a horizontal direction and a vertical direction of the size-reduced block and a pixel-based value within a corresponding portion of pixel-based values within the size-reduced block.

5. A method for compensating for motion prediction according to claim 3, wherein the search range determining step determines as one of the motion vector search ranges a peripheral pixel range including an enlarged lower layer motion vector

enlarged from a lower layer motion vector between a corresponding portion of pixels where an absolute-value sum of pixel-based values within the size-reduced block is minimum and the size-reduced block.

6. A method for compensating for motion prediction according to claim 1, further comprising:

a search range selecting step of selecting only the search ranges within the size-reduced reference images in which a difference of pixel-based values is minimized from the respective size-reduced blocks of among search ranges within the size-reduced reference images determined in the search range determining step, wherein

the detecting step further includes detecting an optimal motion vector by using only search ranges within the size-reduced reference images selected in the search range selecting step.

7. A method for compensating for motion prediction according to claim 1, wherein:

the detecting step includes detecting the optimal motion vector depending on respective differences in pixel-based values between the size-reduced blocks and the size-reduced reference images, a quantizing scale function and a generation code amount for the motion vector differences.

8. A method for compensating for motion prediction according to claim 1, wherein the detecting step includes detecting an optimal motion vector based on a Rate Distortion

optimization process.

9. A method for compensating for motion prediction according to claim 1, wherein the detecting step includes sequentially changing the pixel-based sizes of the motion compensating blocks from a greater pixel-based size to a smaller pixel-based size, so as to size-reduce the search range each time a change is made.

10. An apparatus for compensating for motion prediction on each of a plurality of motion compensating blocks formed by dividing an objective frame image of successive frame images by using a plurality of reference frame images while sequentially changing pixel-based sizes of the plurality of motion compensating blocks, the apparatus comprising:

hierarchizing means for thinning out pixels of a motion compensating block having a greatest pixel-based size to be taken as an uppermost layer of among blocks with smaller pixel-based sizes, to generate a size-reduced block in a lower layer having a predetermined size-reduction ratio;

search range determining means for determining motion vector search ranges respectively within the plurality of reference frame images, on the basis of the size-reduced block and other size-reduced blocks, and a plurality of size-reduced reference images reduced in size corresponding to the size-reduction ratios of the sized reduced block and other size-reduced blocks respectively; and

detecting means for detecting an optimal motion vector while sequentially changing the pixel-based sizes of the plurality of motion compensating blocks by using the motion vector search ranges determined by the search range determining means.